

On unfaithful transitive representations of finite inverse symmetric semigroup \mathcal{IS}_n

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Let $N = \{1, 2, \dots, n\}$ be a finite set. The semigroup of all partial one-to-one self-maps of N is called *the inverse symmetric semigroup* and is denoted by $\mathcal{IS}(N)$ or \mathcal{IS}_n . A homomorphism φ from any inverse semigroup S to the inverse symmetric semigroup $\mathcal{IS}(X)$ on a set X is called *a permutation representation*. The permutation representation $\varphi : S \rightarrow \mathcal{IS}(X)$ of the inverse semigroup S is called *transitive on X* if for any $a, b \in X$ there exists a partial permutation $h \in \varphi(S)$ such that $h(a) = b$. Every faithful transitive representation of the finite inverse symmetric semigroup \mathcal{IS}_n is equivalent to the standard representation of \mathcal{IS}_n by partial permutations of N [?].

We have counted the degrees of unfaithful transitive representations of the inverse symmetric semigroup \mathcal{IS}_n . An analogue of Burnside's lemma is proved for transitive permutation representations of \mathcal{IS}_n .

References

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